Installing Natural under BS2000/OSD

This document describes step by step how to install Natural under the operating system BS2000/OSD using Adabas system files.

The following topics are covered:

- Prerequisites
- Installation Tape for Natural under BS2000/OSD
- Installation Procedure for Natural under BS2000/OSD
- Installation Verification for Natural under BS2000/OSD

Prerequisites

- A supported version of the BS2000/OSD operating system must be installed. For the supported versions of the operating systems, refer to Operating/Teleprocessing Systems Required (in the current Natural Release Notes for Mainframes).
- A supported version of Adabas must be installed. For the supported versions, refer to Natural and Other Software AG Products in the current Natural Release Notes for Mainframes.
- As a rule of thumb, each major Software AG product requires approximately 20 MB space in the Adabas database to store the Natural objects supplied by Software AG.

Installation Tape for Natural under BS2000/OSD

The installation tape contains the datasets listed in the table below. The sequence of the datasets, the dataset type, the number of library blocks needed and the space each dataset requires on disk are shown in the **Report of Tape Creation** which accompanies the installation tape.

Dataset Name on Tape	Dataset Name on Disk	Contents
NAT*nnn*.SYSF	NAT*nnn*.SYSF	Empty Natural system file
NAT*nnn*.ERRN	NAT*nnn*.ERRN	Natural error messages
NAT*nnn*.PAMS	NAT*nnn*.MOD	Natural module library
NAT*nnn*.SRCE	NAT*nnn*.SRC	Natural source modules
NAT*nnn*.MACS	NAT*nnn*.MAC	Natural macros
NAT*nnn*.JOBS	NAT*nnn*.JOBS	Example installation jobs
NAT*nnn*.INPL	NAT*nnn*.INPL	Natural system objects
NAT*nnn*.EXPL	NAT*nnn*.EXPL	Natural example objects

The notation *nnn* in dataset names represents the version number of the product.

Note: The dataset NAT*nnn*.JOBS will be converted automatically into a LMS-library when it is copied from tape to disk.

Copying the Tape Contents to Disk

If you are not using SMA, use the procedure described below. In this procedure, the values specified below must be supplied.

To copy the datasets from tape to disk, perform the following steps:

1. Copy the Library SRVnnn.LIB from Tape to Disk

This step is not necessary if you have already copied the library SRV*nnn*.LIB from another Software AG tape. For more information, refer to the element #READ-ME in this library.

The library SRV*nnn*.LIB is stored on the tape as the sequential file SRV*nnn*.LIBS containing LMS commands. The current version *nnn* can be obtained from the **Report of Tape Creation**. To convert this sequential file into an LMS-library, execute the following commands:

```
/IMPORT-FILE  SUPPORT=*TAPE(FILE-NAME=SRVnnn.LIBS, -
/   VOLUME=<volser>, DEV-TYPE=<tape-device>)
/ADD-FILE-LINK  LINK-NAME=EDTSAM, FILE-NAME=SRVnnn.LIBS, -
/   SUPPORT=*TAPE(FILE-SEQ=3), ACC-METH=*BY-CAT, -
/   BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ  '/'
@SYSTEM 'REMOVE-FILE-LINK  EDTSAM'
@SYSTEM 'EXPORT-FILE  FILE-NAME=SRVnnn.LIBS'
@WRITE  'SRVnnn.LIBS'
@HALT
/ASS-SYSDTA  SRVnnn.LIBS
/MOD-JOB-SW  ON=1
/START-PROG  $LMS
/MOD-JOB-SW  OFF=1
/ASS-SYSDTA  *PRIMARY
```

Where:
<*tape-device*> is the device-type of the tape, e.g. TAPE-C4
<*volser*> is the VOLSER of the tape (see **Report of Tape Creation**)

2. Copy the Procedure COPY.PROC from Tape to Disk

To copy the procedure COPY.PROC to disk, call the procedure P.COPYTAPE in the library SRV*nnn*.LIB:

```
/CALL-PROCEDURE  (SRVnnn.LIB,P.COPYTAPE), -
/   (VSNT=<volser>, DEVT=<tape-device>)
```

If you use a TAPE-C4 device, you may omit the parameter DEVT.

3. Copy all Product Files from Tape to Disk

To copy all Software AG product files from tape to disk, enter the procedure COPY.PROC:

```
/ENTER-PROCEDURE  COPY.PROC, DEVT=<tape-device>
```

If you use a TAPE-C4 device, you may omit the parameter DEVT. The result of this procedure is written to the file 'L.REPORT.SRV'.

Installation Procedure for Natural under BS2000/OSD

Naming Conventions

In the following text, the library name "*JOBLIB*" stands for

- the example job library (NAT*nnn*.JOBS) if you are **not** using SMA or
- the SMA job library (see SMA parameter JOBLIB in SMA Parameter Group BASIC) if you are using SMA.

Note
Software AG uses the following naming conventions for source elements in the library *JOBLIB*:

A<*product-code*><*function*> = Assembler sources
L<*product-code*><*function*> = Instruction for TSOSLNK/BINDER

Example: ANATFRNT, ANATRENT, ANATSTUB or LNATFRNT

Therefore Software AG has changed some names (compared with Natural Version 3.1), e.g. the element ABS2STUB was renamed to ANATSTUB

Step 1: Load the FNAT System File

(Job I050, Step 0100)

If you are installing into an existing Natural 4.1 FNAT file, skip this step.

Load the empty Natural system file (dataset NAT*nnn*.SYSF) using the ADALOD utility.

This file will contain all Natural objects supplied by Software AG. Its size depends on the number of products to be installed later. As a rule of thumb, 20 MB can be assumed for each major Software AG product.

The following ADALOD parameters must not be altered:

```
ISNREUSE=YES
```

To avoid Natural errors NAT9988 and NAT7397 after reorganization of the FNAT system file using ADAULD/ADALOD, the parameter USERISN=YES should be left as set by System Maintenance Aid.

The file number *fnat* of the FNAT system file can be chosen as described under Natural profile parameter FNAT (in the Parameter Reference documentation).

Step 2: Load the FUSER System File

(Job I050, Step 0101)

You have the following options:

- You can use a new FUSER file for Version 4.1.
- You can use an existing Version 3.1 FUSER file to be shared by Versions 3.1 and 4.1.
- You can use an existing Version 3.1 FUSER file to be used by Version 4.1 only.

Reuse an Existing Version 4.1 FUSER System File

If you want to use the existing Natural Version 4.1 FUSER system file, skip this step.

Use a New Version 4.1 FUSER System File - First-Time Installation

If you do **not** want to share the FUSER system file, proceed as follows:

Load the empty Natural user file contained in dataset NATnnn.SYSF using the ADALOD utility.

In this file, all user-written Natural programs are stored.

The following ADALOD parameters **must not** be altered:

```
ISNREUSE=YES
```

The file number *fuser* of the FUSER system file can be chosen as described under Natural profile parameter FUSER (see Parameter Reference in the Natural Reference documentation).
For the use of a new and empty FUSER system file for Natural Version 4.1, no additional system-file-related actions are necessary.

Reuse an Existing Version 3.1 FUSER System File - Migration from Natural Version 3.1

If you want to use the existing Natural Version 3.1 FUSER system file and you do not want to share the FUSER system file, skip this step.

Using a Version 3.1 FUSER File to be shared by Natural Versions 3.1 and 4.1

If you use an existing Natural Version 3.1 FUSER system file to be shared by Natural Versions 3.1 and 4.1, you must upgrade your Natural Version 3.1 installation to Version 3.1.6.

Natural Version 3.1.6 Service Pack I0010 or a subsequent Service Pack is required. Service Pack I0010 and all subsequent Service Packs contain all the necessary Version 3.1 based solutions for Natural Version 4.1.

User Application Programming Interfaces USR* in Library SYSEXT

With Natural Version 4.1, the USR* programs from the delivered library SYSEXT will run in a special mode. As a result, the USR* programs need no longer set further steplibs to execute related objects for processing. This will reduce the impact on the Natural buffer pool search logic and will improve the performance significantly if user exits are used extensively within user written applications.

To introduce this mode, it is necessary that the user exits are cataloged with Natural Version 4.1. This implies that the user exits cannot be executed with Natural Version 3.1. This behavior is different to the previous Natural version and will have some impact on the migration path of applications that calls user exits.

Use of USR* Programs

Usually, the access of USR* programs by an application requires that the user application programming interfaces be copied from library SYSEXT to either the application libraries on the FUSER system file or to library SYSTEM on the FUSER system file or library SYSTEM on the FNAT system file, respectively, or any other library which is defined as steplib for the application. Library SYSEXT can also be used as steplib. Due to the fact that, as of Natural Version 4.1, the delivered user application programming interfaces will always be cataloged with the latest Natural version, we recommend that the user application programming interfaces should reside on the FNAT system file. This will ensure that the right version is executed and will separate user written applications from SAG modules.

If applications which call user application programming interfaces should run with both Natural Version 3.1 and Natural Version 4.1, it must be made sure that the user application programming interfaces delivered with the corresponding Natural Version are used.

The following scenarios may be considered:

Using a Version 3.1 FUSER File for Natural Version 3.1 and 4.1

If the same FUSER system file shall be user in a Natural Version 3.1 and Version 4.1 environment in parallel the following steps are recommended:

- Remove all USR* modules you have copied from library SYSEXT into application libraries on your FUSER system file.
- In both environments, copy the used USR* modules from library SYSEXT to library SYSTEM on the corresponding FNAT system file.
- Alternatively, the USR* modules can be moved to another system library on FNAT which then must be defined as steplib, or library SYSEXT can be used as steplib for the applications. Then automatically in both environments the right versions of the user application programming interfaces are executed.

Using a Version 3.1 FUSER File for Natural Version 4.1 only

If you want to use the existing Natural Version 3.1 FUSER system file and you do not want to share the FUSER system file, then it is still possible to replace all USR* modules you have copied from library SYSEXT into application libraries with the new USR* objects from the Version 4.1 library SYSEXT.

But the preferred way is to remove all user application programming interfaces on the FUSER system file and copy the used user application programming interfaces from library SYSEXT to library system of the FNAT system file or use an SYS library on FNAT as steplib.

Using a New FUSER File for Natural Version 4.1

If you want to port existing applications to a new FUSER file, copy all application objects but no SAG USR* objects to the new FUSER system file. Then proceed as described in the scenario above.

Migration

The SYSMAIN FIND function can be used to search for all USR* modules stored in a specific library on the FUSER system file or across the whole system file. In addition, PREDICT cross reference data can be used to determine all referenced user application programming interfaces.

The file number *fuser* of the FUSER system file can be chosen as described under Natural profile parameter FNAT (in the Parameter Reference documentation).

Step 2.1: Load the FDIC System File

(Job I050, Step 0103)

Skip this step

- if you want to install Predict (in this case, use the corresponding installation step in the Predict Installation documentation), or
- if you want to use an existing FDIC system file (an existing FDIC system file can be shared by Natural Versions 3.1 and 4.1), or
- if you do not use your own FDIC system file.

If Predict is used, the sharing of the FDIC system file requires that Predict Version 4.2.2 has been installed.

Load the empty FDIC file contained in dataset NAT*nnn*.SYSF using the ADALOD utility, as described below.

The following ADALOD parameters **must not** be altered:

```
ISNREUSE=YES
```

The file number *fdic* of the FDIC system file can be chosen as described under Natural profile parameter FDIC (in the Parameter Reference documentation).

Step 2.2: Load the FSEC System File

Skip this step,

- if you do not use Natural Security, or
- if you want to use an existing FSEC system file, or
- if you do not want to use an own FSEC system file.

If you use Natural Security, refer to Installing Natural Security.

Step 2.3: Load the Scratch-Pad File

This step is not supported by SMA.

The scratch-pad system file can be used exclusively by the new Natural version or it can be shared by different versions of Natural.

If you do **not** want to use a scratch-pad file, skip this step.

If you do want to use a scratch-pad file; that is, if you want to use read-only system files (profile parameter ROSY=ON), see also Natural Scratch-Pad File (in the Natural Operations for Mainframes documentation), proceed as follows:

Load the empty scratch-pad file contained in dataset NAT*nnn*.SYSF, using the ADALOD utility as described below.

The following ADALOD parameter **must not** be altered:

```
ISNREUSE=YES
```

For the optional scratch-pad file inclusion, the following NATPARM parameters must be added or, if already present, updated with:

```
LFILE=(212,dbid,fnr)
ROSY=ON
```

Step 3: Assemble the Natural BS2000/OSD Stub Module and Batch Driver

(Job I055, Steps 0216 to 218)

Assemble the following source modules:

- ANATSTUB (Natural BS2000/OSD stub module),
- ANATFRNT (Natural BS2000/OSD front-end batch driver)
- ANATRENT (Natural BS2000/OSD reentrant batch driver).

These source modules are contained in the library *JOBLIB* .

Step 4: Create the Parameter Module

(Job I060, Step 0010)

Create the Natural batch parameter module.

The following parameters in the source parameter module ANATPARM, which is contained in library JOBLIB, must be modified for the insta llation:

```
FNAT=(dbid,fnat)
FUSER=(dbid,fuser)
```

For *dbid*, *fnat* and *fuser*, use the values yo u specified when loading the system files (see Steps 1 and 2).

For all other parameters, you can generally use the default values.

Modify only the values of those parameters whose default values do not suit your requirements.

For the individual parameters contained in the parameter module, refer to the Parameter Reference overview in the Natural Reference documentation.

Assemble the parameter module.

Step 5: Link the Natural Nucleus

(Job I060, Steps 3801, 3802)

Link the source modules LNATFRNT (front-end part of batch nucleus) and "LNATSHAR" (shared part of batch nucleus).

These source modules are contained in the library *JOBLIB* .

With the INCLUDE instruction for the parameter module, specify the name of the Natural parameter module created in Step 4.

Using a Sort Program

If you wish to use a sort program (either Natural’s internal one or an external one), include the module NAT2SORT.

It is also possible to place NAT2SORT in a load library from where it can be loaded dynamically at runtime; this requires that "NAT2SORT" is specif ied with the profile parameter RCA.

Step 6: Start All Pools

Start the job E.START.ALL which is contained in the library *JOBLIB*.

To end all pools, start job E.END.ALL which is contained i n the library *JOBLIB*.

Step 7: Load the System Programs

(Job I061, Step 0100)

Use the Natural system command INPL to load the Natural system objects (the dataset NAT*nnn*.INPL) into the Natural system files.

Step 8: Load the Error Messages

(Job I061, Step 0102)

Load the Natural error messages file (dataset NAT*nnn*.ERRN) using the program ERRLODUS (described in the Natural SYSERR Utility documentation).

Step 9: Load the Examples

(Job I061, Step 0103)

Use the system command INPL to load the Natural example objects (dataset NAT*nnn*.EXPL) into the Natural system file.

Installation Verification for Natural under BS2000/OSD

For base Natural, there are no specific installation verification procedures. After the last step of the installation procedure has been successfully performed, check that the following results are available:

- Communication between Adabas and Natural is working.
- The Natural system files have been loaded.
- Batch Natural is operational.

